

REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated March 7, 2007. This amendment is filed with a request for a one month extension of time and authorization to charge Deposit Account No. 50-0951 for the appropriate extension fee.

At the time of the Office Action, claims 1-4 and 6-14 were pending. In the Office Action, objections were raised to claim 8 and the drawings. Claims 1-4, 6-8 and 11-14 were rejected under 35 U.S.C. §112, second paragraph. Claim 9 was rejected under 35 U.S.C. §102(e). Claims 1-4, 6-8 and 10-14 were rejected under 35 U.S.C. §103(a). The objections and rejections are discussed in more detail below.

I. Claim Objections

In the Office Action, claim 8 was objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of the previous claim. Claim 8 is cancelled here, and withdrawal of the objection is thus respectfully requested.

II. Objections to the Drawings

In the Office Action, the drawings were objected to for failing to show every feature of the invention specified in the claims. More specifically, the grouping of successive segments, the two path graphs, and taking into account only segments that belong to levels higher than the level m_{inf} when a predetermined threshold is reached, were required to be shown or the features cancelled from the claim.

New Figs. 6 and 7 are attached, which show the above-referenced features. In particular, Fig. 6 shows segments having a level of 3 or higher, and two paths between segments, and Fig. 7 shows that groups of segments of level 3 are substituted by a single segment of level 3 (shown by the heavy lines, and removal of segments A6 and A2).

In view of the above and foregoing, it is respectfully requested that the objections to the drawings be withdrawn.

III. Claim Rejections under 35 U.S.C. §112

Claims 1-4, 6-8 and 11-14 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended the claims in a manner believed to overcome the rejections, and notes that the subject matter of original claim 1 is explained in the specification on page 16, lines 21-22. Withdrawal of the rejections is thus respectfully requested.

IV. Rejections on Art

Claim 9 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2002/0169543 to Blewitt ("Blewitt"). Claims 1-4, 6, 7, 8, 11 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2004/0039520 to Khavakh et al. ("Khavakh") in view of U.S. Patent No. 6,038,559 to Ashby et al. ("Ashby"). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Blewitt as applied to claim 9, and further in view of U.S. Patent No. 5,170,353 to Verstraete. Claims 13 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Khavakh in view of Ashby as applied to claim 1, and further in view of U.S. Patent No. 5,610,821 to Gazis et al. ("Gazis").

Claim 9 is made dependent upon claim 1 herein. Thus, the §103(a) rejections based on Khavakh and Ashby will be discussed first.

Khavakh discloses a method using rank suppression in a classification of road segments, which is quite different from the road segment selection of the present invention. Khavakh does not disclose searching for a group of successive segments with a given level m , comprising exclusively intermediate nodes which do not belong to any segment with a level which is at least equal to m , other than those of the group of successive segments with the level m concerned; and the group of successive segments is substituted by a single segment with a level m .

Ashby teaches a geographic database for use with a navigation application program using aggregations of segments of roads. Ashby does not teach developing two path graphs, substantially starting from two points (A,B) and substituting a group of successive segments of level m by a single segment of level m . Furthermore, Ashby does not teach calculating the number of segments of the graph developed of a lowest level m_{inf} , starting from a predefined threshold of

number of segments of level m_{inf} , said at least one of the two path graphs being developed taking into account only the segments which belong to the levels which are strictly higher than the level m_{inf} .

The present application provides a simple and fast method for determining the minimal cost path between two points (A,B). The claimed method is not taught or suggested by Khavakh or Ashby, either singly or combined. In particular, Khavakh does not solve the problem addressed in the application because its method relies on physical segments and nodes. In contrast to Khavakh, the claimed method converts the physical road network into a virtual network where group of successive segments is substituted by a single segment. Thus, the virtual network created has a lower number of segments in order to speed up the path calculation.

a) Inefficiency of the rank suppression in Khavakh

The presently claimed method calculates the number of segments of the graph developed of a lowest level m_{inf} , starting from a predefined threshold of number of segments of level m_{inf} , said at least one of the two path graphs being developed by taking into account only the segments which belong to the levels which are strictly higher than the level m_{inf} .

The creation of a virtual network modifies the above algorithm. Indeed, the claimed method teaches calculating the number of segments by taking into account aggregated segments and common segments indifferently, whereas in Khavakh, only the common segments are taken into account. Thus, for a given threshold, the claimed method can spread the search further than in Khavakh thanks to the aggregated segments.

b) Common segments are not substituted by aggregated segments in Ashby

Ashby teaches road segment aggregation but this aggregation has nothing to do with the aggregation which occurs in the claimed method. In the present method, a group of segments is substituted by a single segment whereas in Ashby, an aggregated segment is stored separately from the other segments (abstract, lines 23-27). There is no substitution but a juxtaposition of the aggregated segments over the common segments. In Ashby, during graph development, there is a comparison between the aggregated segments and the common segments (column 30, lines 3-6). This comparison slows down the computation of the path.

c) Substituting segments is a drawback according to Ashby

The person skilled in the art is discouraged to use segment substitution in view of Ashby. In Ashby, segment substitution is prevented because the internal nodes of the aggregated segments would not be available (column 29, lines 27-29). Moreover, it would prevent the route calculation program from switching from a lower layer to a higher layer (column 29, lines 32-33).

Thus, the philosophy of Ashby is to spread different paths by keeping all the intermediates nodes available for calculation. The method of Ashby is therefore complex to implement and time consuming.

d) Non-obviousness of the use of substituted segments

The combination of segments aggregation and segments substitution decreases the number of parameters and the computation time. Starting from Khavakh, the person skilled in the art is not urged to use segment substitution because such a substitution is strongly discouraged by Ashby.

Even if the person skilled in the art would have combined the teachings of Khavakh and Ashby, a method having all the claimed limitations would not have resulted. Combining the aggregated segments of Ashby with the rank suppression of Khavakh would have lead to a dead end because the person skilled in the art would have had to choose between the set of aggregated segments and the sets of common segments, the two sets being stored separately.

Moreover, this choice does not lead to any improvement because the aggregated segments still include internal node information which slows down the computation.

e) Conclusion

For the foregoing reasons, claim 1 is believed to relate to patentable subject matter and to be in condition for allowance. The dependent claims are believed allowable for the foregoing reasons, for their dependence upon an allowable base claim, and because of the further features recited. Additionally, it should be noted that Gazis, Khavakh and Ashby only disclose a base unit equipped with a complete database of road segments for the entire nation which is quite different from the virtual network where all the segments of different levels are connected.

V. Conclusion

Applicants have made every effort to present claims which distinguish over the prior art, and it is thus believed that all claims are in condition for allowance. Nevertheless, Applicants

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invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicants respectfully request reconsideration and prompt allowance of the pending claims.

Date: _____

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Respectfully submitted,



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